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TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

No. 246

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EARTH STATION ANTENNA AT MOREE TO BE UPGRADED

Canberra THE AUSTRALIAN in English 6 Sep 82 p 14

[Text]

SCIENTISTS from the CSIRO Division of Radio-Physics are playing a crucial role in upgrading Australia's international telecommunications system.

The Overseas Telecommunications Comission invited the CSIRO to collaborate with its engineers in upgrading the 127.5m-diameter earth station antenna at Moree.

Previously, CSIRO had been involved with OTC in the successful upgrading of the Carnarvon tracking station.

The Moree upgrading is required to allow it to be used by the new Intelsat V series satellites now coming into operation.

These satellites have twice the channel capacity of the Mark IV series and carry a total of 12,000 two-way voice circuits and two television circuits.

Although the total available frequency bandwidth is identical to that used on earlier satellites, frequency conservation techniques have been used to ensure multiple use of their band width.

To exploit this technique, the older earth station antennas such as Moree 1 have to be upgraded.

The refurbishing also took account of major advances in earth station antenna design since Moree was built in 1968.

CSIRO scientists have incorporated these in the upgrading by calling for a completely new 2.8m diameter sub-reflector and adjustment of the 300 panels forming the quasi-paraboidal main surface of the dish.

One of the major components in the project has been the development of a suitable conical horn which is required not only to provide optimum antenna performance across the receiving band (3.7 to 4.2 gigahertz) and transmit band (5.92 to 6.42 gigahertz), but also to get a high degree of isolation when using frequency conservation techniques.

To achieve optimum antenna performance, the horn must couple the energy from the transmitter and transform it into a well-defined conical beam so that most of it will incident on the sub-reflector.

After reflection from the sub-reflector, the energy is again reflected.

This time from the main reflecting surface so that it forms a very narrow beam in the direction of the satellite.

For receiving, the reflection process is reversed.

A splitting device is used to enable simultaneous transmitting and receiving.

A unique feature of the 2.5m long horn is its internally grooved surface.

CSO: 5500/7506

AUSTRALIA

NEW COMPUTER INDUSTRY ENTRANT OFFERS EXPANDED SYSTEM

Canberra THE AUSTRALIAN in English 7 Sep 82 p 18

[Article by Douglas Moore]

[Text]

McILWRAITH-DAVEY Industries, whose main market has been in the building industry, is moving into the computer business.

One of its subsidiaries, Total Electronics, of Burwood, Victoria, has released Intel Corp's new System 86/330 16-bit microcomputer, which is said to provide four times a minicomputer's numeric processing performance for a comparable price.

A spokesman for Total Electronics said there were two main application areas for the 86/330:

(a) Customers of OEMs (original equipment manufacturers) would benefit from the system in technical applications requiring rapid response to terminals, instruments, communication lines and other high-speed devices.

These included industrial automation, data acquisition, communication, specialised data and word processing.

(b) Engineers would use the system as a program development tool for Intel iRMX 86 based iAPX 86/88 board systems.

"Previously, Intel customers purchased various system components — microcomputer boards, chassis, power supplies, peripherals, operating systems, languages and utilities — and integrated them," he said.

"Now, with the 86/330, this often difficult and time consuming task has been eliminated."

Users could begin writing applications software immediately, without set-up, integration and testing.

Total Electronics had engineers trained to support OEMs at both the hardware and operating system level.

The company would offer workshops on the iRMX 86 operating system throughout the year.

The 86/330 was based on Intel's Multibus microcomputer board products, he said.

Performance

"It uses the latest VLSI technology. It contains a 16-bit iAPX 86/20 processor set for high performance general-purpose and numeric computation."

Combined with the iRMX 86 real-time, multi-tasking operating system, the 86/330 provided numeric processing performance four times faster than that of a mid-range minicomputer for a comparable price.

The general manager of Intel's OEM microcomputer systems operation in Hillisboro, Oregon, Mr Bill Lattin, said the VLSI based 86/330 offered three times the user memory, four times the numeric performance and 50 per cent more mass storage than a comparably equipped minicomputer based system.

"Advantages of VLSI in designing microcomputer systems include lower cost and the promise of further price reductions in VLSI components, an easier path for expansion than with present minicomputers, and greater system flexibility than with today's minis."

He said the 86/330 was the first system to use VLSI co-processors — the 8087 and 8089.

Languages supported included Pascal-86, Fortran-86, PL/M-86 and Assembler-86.

Through Intel's UDI (universal development interface) it supported third-party industry standard languages such as Basic, Cobol and C.

"The system also includes a [illegible] megabyte Winchester disc and a one megabyte floppy disc," Mr Lattin said.

"Previously, the software development capability of minicomputers was the major advantage they held over microcomputers.

"With the introduction of the System 86/330, minicomputer software development techniques are available to the microcomputer user."

CSO: 5500/7506

EIGHT LOCAL SYDNEY-AREA RADIO STATIONS GET LICENSES

Sydney THE SYDNEY MORNING HERALD in English 4 Sep 82 p 3

[Article by Richard McGregor]

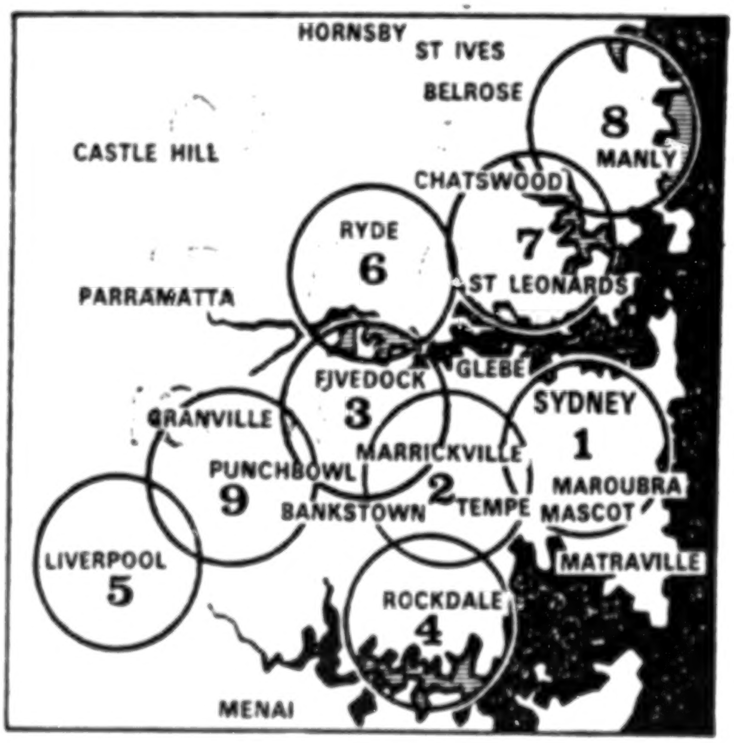
[Text] The Australian Broadcasting Tribunal announced yesterday that it had granted eight C — or community — class licences for public broadcasting stations to serve local government areas in Sydney.

Broadcasts will begin on September 1 next year and will cover a radius of five kilometres.

The stations will be barred from running advertisements, but they may accept sponsorship, which means that they can give the name and address of a company, but not details of products and services.

The tribunal has granted licences to the following groups:

- The Manly-Warringah Media Co-operative Ltd for the local governments areas of Manly and Warringah.
- The Liverpool-Green Valley Community Radio Association for Liverpool, Green Valley and Fairfield.



- Bankstown City Radio for Bankstown and Auburn.
- Ryde Regional Radio Co-operative Ltd for Ryde and Hunters Hill
- Northside Boradcasting Co-operative Ltd for Ku-ring-gai, Willoughby, Lane Cove, Mosman and North Sydney.
- RDJ-FM Community Radio for Ashfield, Burwood, Concord, Drummoyne and Strathfield.
- Radio Eastern Sydney Co-operative Ltd for the City of Sydney, Botany, Randwick, Waverley and Woollahra.
- Radio Skid Row for Sydney, Leichhardt, Marrickville and Botany.

A ninth licence for the local government areas of Canterbury, Hurstville, Marrickville, Kogarah and Rockdale is still under consideration.

Eleven groups, in all, applied for the licences.

There will be some overlapping but it is not expected that the stations will interfere with each other.

Mrs Dorothy Broadhead, the secretary of RDJ-FM, said detailed programming had been held up until the granting of the licence. The programming will be monitored by the Broadcasting Tribunal.

RDJ-FM expects to broadcast initially for 57 hours a week, mostly outside working hours, and, later, for 116 hours a week.

Mr Warren Hicks, a director of the station, said the station would be broadcasting outside working hours because they were self-funded and would be relying heavily on volunteer labour.

RDJ-FM will be broadcasting from two studios in the Woodstock building at Burwood.

"We will be covering the operations of the five local councils in our broadcast area; we will be covering local organisations like the Parents and Citizens Association auxiliaries, and welfare groups.

"We will be having music programs, but they will be of a specialist nature.

"All the new licencees are finding that local sport is playing a big part, especially on the weekend programs because there is no other outlet for it."

CSO: 5500/7506

BRIEFS

RASHID HEADS ITU DELEGATION--Bangladesh has been unanimously elected as one of the Vice-Chairmen of the Group of 77 of the plenipotentiary conference of the international Telecommunication Union now being held in Nairobi. The last conference was held in 1973 according to a message received in Dacca on Monday, says BSS. The leader of the three-member Bangladesh delegation Mr M.A. Rashid, Additional Secretary in charge of Posts and Telecommunications Division in an address on Wednesday last urged the technologically advanced and developed countries to meet the requirements of the developing countries by grants and soft loans not only to finance procurement of equipment and machinery but also to meet some of the rising local costs as many of the developing countries are short of local fund. He expressed the hope that the conference would take a pragmatic decision of adopting concrete measures to meet the telecommunication requirements of the developing countries so that the world's telecommunication network could develop and function as an integrated whole in the interest of developing and developed countries of the world. Mr Rashid declared the firm policy of the present Government of Bangladesh for the total development of telecommunication sector in Bangladesh. The speech of the leader of Bangladesh delegation was highly appreciated by the delegates from 157 member countries attending the conference. [Text] [Dacca THE BANGLADESH OBSERVER in English 5 Oct 82 p 1]

CSO: 5500/7018

INDIA CRITICIZES PRESS FREEDOM ORGANIZATIONS

Calcutta THE STATESMAN in English 9 Oct 82 pp 1, 7

[Text]

PARIS, Oct 8—The Indian Government tried unsuccessfully this week to keep two international organizations concerned with Press freedom from attending a forthcoming meeting of the United Nations agency, UNESCO.

Mr T N Kaul, the Indian Government's representative to the executive board of UNESCO, claimed that the two organizations, the International Press Institute and the World Press Freedom Committee, were "hostile and negative" towards UNESCO and, therefore, should not be granted the right to attend the UNESCO general conference as observers.

Mr Kaul raised a similar objection to the international Jewish organization, B'Nai Brith, claiming that it was "Zionist-oriented" and, hence, should be excluded.

The objections to all three organizations were rejected by the executive board, as recommended by the UNESCO director-general, Mr Amadou Mahtar M'Bow of Senegal. He argued that while the two Press organizations were, in fact, "negative" towards UNESCO, credible organizations should be allowed to watch the general conference and UNESCO should not give the appearance that it wants to avoid scrutiny.

Mr Kaul, who has served as Indian Ambassador to both the Soviet Union and the USA, represents the Indian Government on the UNESCO executive board, but the Indian Ambassador to UNESCO is Mr Narendra Singh.

The International Press Institute, with offices in London and Zurich (Switzerland), acts as a worldwide watchdog on international Press issues. Each year, it publishes a highly respected report on the conditions of the Press at the international level and in individual countries. Its president is now from The Netherlands, but Mr Kaul made a clear reference to its past president, Mr Cushrow Irani, Managing Director of The Statesman.

The former president of one of these Press groups, Mr Kaul said without naming Mr Irani, travels the world pressuring Governments to withdraw from UNESCO. Mr Kaul said this was part of a "worldwide anti-UNESCO campaign" that began in 1980 at the UNESCO general conference in Belgrade (Yugoslavia). This unnamed president Mr Kaul alleged, was conducting "activities in India that are far from helpful to Press freedom".

Mr Kaul said he favours Press freedom, but reporting must be balanced and fair. He said much of the reporting about developing countries was "unfair, biased and prejudiced". He added: "Freedom is all right, but there's no absolute freedom anywhere."

The World Press Freedom Committee is based in the USA but, like the International Press Institute, has wide representation in the Western world and in many developing countries. Both are comprised of professional, non-Governmental journalists and news executives.

Mr Judson Gooding, former correspondent for Time magazine and a specialist on communications for the U.S. delegation to UNESCO, described the members of both organizations as "distinguished participants from the world of communications". Their aims, Mr Gooding said, were "to further the causes of freedom of the Press and seek more diversity of communications, both of which are stated objectives of UNESCO as well".

British and West German delegates also spoke in favour of granting the two organizations "category C status" as observers, which carries only very limited rights. Taking their cue from the UNESCO Director-General, the powerful block of African nations also supported granting the observer status to the two Press organizations. Both were finally admitted unanimously.

In agreeing to withdraw his objections for the moment, Mr Kaul nonetheless, did so with the stated caveat that he would raise the issue again before the general conference, due to begin on November 23, if any more "negative information" surfaced about either organization. He said scrutiny should be given to the funding of both organizations.

"I have only told part of the story of these organizations", Mr Kaul said. He said the UNESCO executive board should have "no illusions" about them. "Sooner or later, the board will have to be "more selective, more impartial", Mr Kaul added.

The Socialist world, Mr Kaul said, used to view India as "the running dog of Western imperialism", but it has learned better and now respects India's truly non-aligned position. But Mr Kaul said that many in the West still do not understand this.

The UNESCO general conference is scheduled to last about two weeks and approve a plan setting UNESCO activities for the next six years, with a budget of well over $1 billion. Many Western diplomats have said that the plan contains several programmes that are not compatible with their concept of freedom of the Press.

Neither the World Press Freedom Committee nor the International Press Institute issued any immediate response to Mr Kaul's remarks.

CSO: 5500/7017

LOK SABHA DISCUSSES SATELLITE LAUNCHINGS, PROBLEMS

New Delhi PATRIOT in English 5 Oct 82 p 5

[Text] The launch of INSAT-1B satellite, the successor to the ill-fated INSAT-1A scheduled for July next, has been postponed by six months so that it does not fall prey to the technical failures that spelt the death of the communications space package, Minister of State for Science, Technology and Space C.P.N. Singh told Parliament on Monday.

INSAT-1B which was scheduled for launch next July is now undergoing corrective changes in the light of NASA data available from the STS space flights, and a firm schedule would be available only in November this year, Mr Singh told the Lok Sabha during a call attention motion, and the Rajya Sabha in a voluntary statement.

Faced with a barrage of questions from the Opposition during which some MPs charged that INSAT-1A had been sabotaged and others asked the Government what it proposed to do to ensure that plans on communication links in the country and TV did not go awry, the Minister assured that short-term alternative arrangements were being made to tide over the "serious setback" received by the failure of INSAT-1A.

The Minister also assured that the satellite had failed during the 180 all-risk insured period. The insurance cover was of US dollars 64.9 million and Ford Aerospace was responsible for the operation and maintenance side by side with the Indian scientists before handing over charges. The insurers, New India Assurance Company, had been informed and risk cover obtained from them.

In the Rajya Sabha also members sought clarifications on this aspect, pointing out that money ought to be obtained from the contractors and not just from another Indian agency which was the insurer.

In the Lok Sabha, replying to call attention motion moved by Mr Rajat Singh (Lok Dal) and others, Mr Singh said that the exact cause of the failure of INSAT-1A would be known only after the completion of the investigation by a 20-member finding committee of scientists. The committee had been asked to submit the report before the end of this month.

The Minister assured the House that all organisations concerned with the project including the Ford Aerospace and Communication Corporation (FACC) which manufactured the satellite would be associated with the fact-finding committee.

Mr Singh said that a gist of the report of the committee would be tabled in the House as demanded by Mr Harikes Bahadur (DSP).

Mr Bahadur said "there is a doubt whether FACC had played some mischief." Mr Ram Vilas Paswan (Lok Dal) also asked whether "sabotage" was the reason for the failure of the project. The Minister said "it is very difficult to say whether there was any sabotage or not. This will be known after the present inquiry. However, "I do not believe there was any room for sabotage."

Mr Singh told Mr Bahadur that the Indian scientists had been fully associated with the project.

Mr Singh denied there was any fuel offload at the launch pad to reduce the satellite's excess weight.

Mr Singh made it clear that the failure had nothing to do with the allotment of the parking slot. India had got the desired slot from the International Radio Telecommunication Union on a first-cum-served basis.

Mr Chandranjit Yadav (Janvadi) said India should develop its technology and expertise to launch future satellites from its own launch facilities.

Earlier, Information Minister N.K.P. Salve informed the Rajya Sabha that due to the INSAT-1A becoming non-operational, eight TV stations put on the national circuit had been affected, reports PTI.

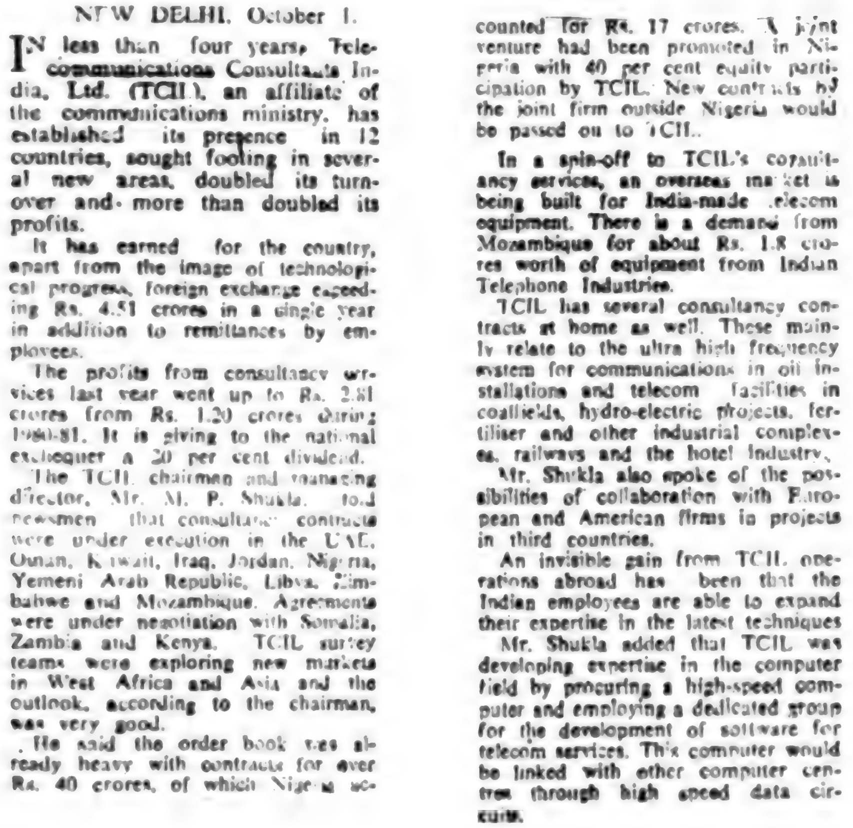
Ten radio stations which had started relaying some centrally originated news bulletins and programmes via the INSAT-1A have reverted to the use of short wave transmission and P and T microwave links. Telecommunications service to remote and island areas has also been affected, he said in a written reply.

CSO: 5500/7016

GREAT STRIDES BY GOVERNMENT TELECOM UNIT NOTED

Bombay THE TIMES OF INDIA in English 2 Oct 82 p 9

[Text]



NEW DELHI, October 1.

IN less than four years, Telecommunications Consultants India, Ltd. (TCIL), an affiliate of the communications ministry, has established its presence in 12 countries, sought footing in several new areas, doubled its turnover and more than doubled its profits.

It has earned for the country, apart from the image of technological progress, foreign exchange exceeding Rs. 4.51 crores in a single year in addition to remittances by employees.

The profits from consultancy services last year went up to Rs. 2.81 crores from Rs. 1.20 crores during 1980-81. It is giving to the national exchequer a 20 per cent dividend.

The TCIL chairman and managing director, Mr. M. P. Shukla, told newsmen that consultancy contracts were under execution in the UAE, Oman, Kuwait, Iraq, Jordan, Nigeria, Yemeni Arab Republic, Libya, Zimbabwe and Mozambique. Agreements were under negotiation with Somalia, Zambia and Kenya. TCIL survey teams were exploring new markets in West Africa and Asia and the outlook, according to the chairman, was very good.

He said the order book was already heavy with contracts for over Rs. 40 crores, of which Nigeria accounted for Rs. 17 crores. A joint venture had been promoted in Nigeria with 40 per cent equity participation by TCIL. New contracts by the joint firm outside Nigeria would be passed on to TCIL.

In a spin-off to TCIL's consultancy services, an overseas market is being built for India-made telecom equipment. There is a demand from Mozambique for about Rs. 1.8 crores worth of equipment from Indian Telephone Industries.

TCIL has several consultancy contracts at home as well. These mainly relate to the ultra high frequency system for communications in oil installations and telecom facilities in coalfields, hydro-electric projects, fertiliser and other industrial complexes, railways and the hotel industry.

Mr. Shukla also spoke of the possibilities of collaboration with European and American firms in projects in third countries.

An invisible gain from TCIL operations abroad has been that the Indian employees are able to expand their expertise in the latest techniques.

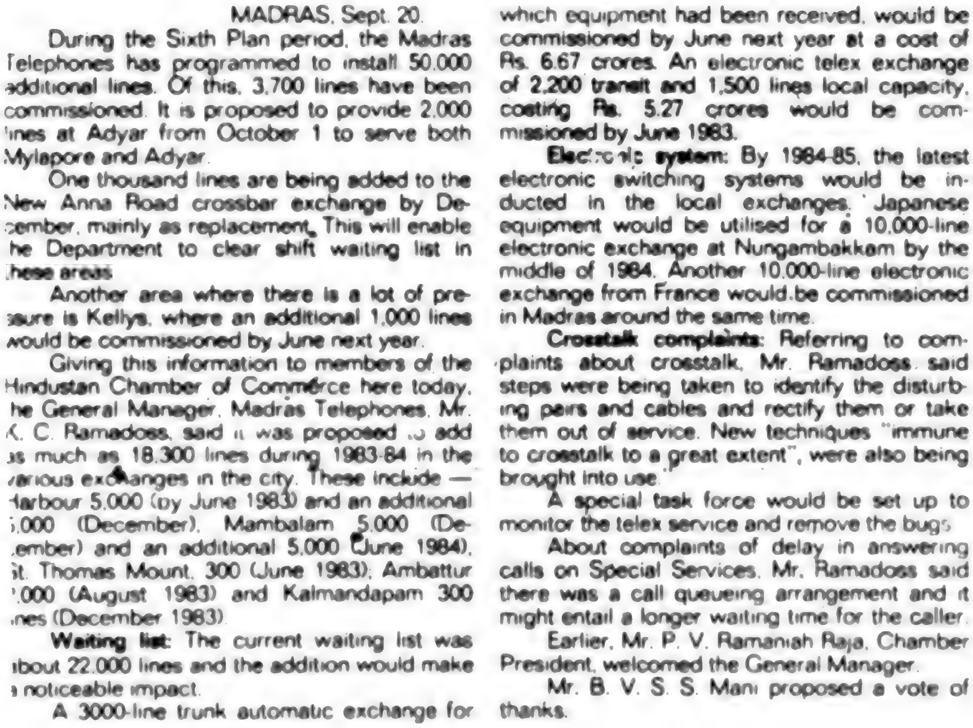
Mr. Shukla added that TCIL was developing expertise in the computer field by procuring a high-speed computer and employing a dedicated group for the development of software for telecom services. This computer would be linked with other computer centres through high speed data circuits.

CSO: 5500/7015

MADRAS PHONE MANAGER TELLS EXPANSION PLANS

Madras THE HINDU in English 21 Sep 82 p 1

[Text]



MADRAS, Sept. 20.

During the Sixth Plan period, the Madras Telephones has programmed to install 50,000 additional lines. Of this, 3,700 lines have been commissioned. It is proposed to provide 2,000 lines at Adyar from October 1 to serve both Mylapore and Adyar.

One thousand lines are being added to the New Anna Road crossbar exchange by December, mainly as replacement. This will enable he Department to clear shift waiting list in these areas.

Another area where there is a lot of pressure is Kellys, where an additional 1,000 lines would be commissioned by June next year.

Giving this information to members of the Hindustan Chamber of Commerce here today, he General Manager, Madras Telephones, Mr. K. C. Ramadoss, said it was proposed to add as much as 18,300 lines during 1983-84 in the various exchanges in the city. These include — Harbour 5,000 (by June 1983) and an additional 5,000 (December), Mambalam 5,000 (December) and an additional 5,000 (June 1984), St. Thomas Mount, 300 (June 1983); Ambattur ,000 (August 1983) and Kalmandapam 300 lines (December 1983).

Waiting list: The current waiting list was about 22,000 lines and the addition would make a noticeable impact.

A 3000-line trunk automatic exchange for which equipment had been received, would be commissioned by June next year at a cost of Rs. 6.67 crores. An electronic telex exchange of 2,200 transit and 1,500 lines local capacity, costing Rs. 5.27 crores would be commissioned by June 1983.

Electronic system: By 1984-85, the latest electronic switching systems would be inducted in the local exchanges. Japanese equipment would be utilised for a 10,000-line electronic exchange at Nungambakkam by the middle of 1984. Another 10,000-line electronic exchange from France would be commissioned in Madras around the same time.

Crosstalk complaints: Referring to complaints about crosstalk, Mr. Ramadoss said steps were being taken to identify the disturbing pairs and cables and rectify them or take them out of service. New techniques "immune to crosstalk to a great extent", were also being brought into use.

A special task force would be set up to monitor the telex service and remove the bugs.

About complaints of delay in answering calls on Special Services, Mr. Ramadoss said there was a call queueing arrangement and it might entail a longer waiting time for the caller.

Earlier, Mr. P. V. Ramaniah Raja, Chamber President, welcomed the General Manager.

Mr. B. V. S. S. Mani proposed a vote of thanks.

CSO: 5500/7014

PLANS TO PROVIDE TELEVISION SETS FOR COMMUNITIES

Karachi DAWN in English 15 Oct 82 p 14

[Excerpt] ISLAMABAD, Oct 14. Raja Mohammad Zafarul Haq, Federal Minister for Information and Broadcasting, informed the Majlis-i-Shoora here today that a proposal to provide community viewing TV sets, specially to the rural population, was under consideration.

Answering a question from Agha Sadruddin Durrani in the Question Hour, the Minister said there was a proposal to establish some 200 community television centres in the country. He said a study in this connection had been completed, and hoped that something would be done within the next six months. He said the prime aim was to promote adult education through TV, and UNESCO had promised to provide 2.20 million dollars for this scheme.

Repling to another question, Raja Zafarul Haq said Pakistan Television Corporation was considering the feasibility of starting a morning transmission on Fridays from 9 a.m. to 12 noon. The programme package might include educational programmes of Allama Iqbal Open University and certain other educational and entertainment programmes, he said. The proposal was sent to the Planning Commission early this year and, if this was approved, this could be started this year. Answering a supplementary question, he informed the House that export of Pakistan TV programmes films on commercial basis was under consideration.

The Minister also informed the House that 75 per cent of the programmes of the Pakistan Television were produced by the Corporation itself and only those imported English programmes were telecast which concerned health, sports, education or entertainment. He said Pakistan Television expected to increase its production within next three years and this would decrease the telecast of imported programmes.

The Minister informed another questioner that the Government would encourage any effort from any quarter to establish an Urdu news agency in the country.

Replying to another question from Mr Durrani, he said there was no Urdu news agency in the country at present and thus no arrangement existed for distribution of Urdu news through wire. He said the Federal Government provided Rs. 3,50,01,087 to Associated Press of Pakistan (APP): Rs. 7,15,000 to Pakistan Press International (PPI): Rs. 21,600 to United Press of Pakistan (UPP); and Rs. 89,400 to International Islamic News Agency (11NA) during the last three years.

He informed another questioner that APP was a private limited company when it was taken over by the Government. Determination of the status of this agency, he said, was being studied at present.

Raja Zafarul Haq informed another questioner that 78.83 per cent of the population was at present being covered by the programmes of the Pakistan Television. He said plans had been made to cover 93 per cent of the population and 68 per cent of the area of the country by the end of 1987. For the remaining seven per cent of the population, he said, arduous surveys of the areas involved had to be carried out and exact period of providing T.V. coverage would be determined after these Surveys had been completed.

'Al-Huda' Programme

Replying to another question, he informed the House that 'Al-Huda', a religious programme of Pakistan Television, had been replaced with a new programme under the title "Fehm-ul-Quran" to include other enlightened scholars representing different schools of thought along with Dr Israr Ahmed. However, he said Dr Israr could not make himself available for participation in the series and had now left for the US.

Explaining the closure of the programme "Al-Huda," he said that the series was one of popular religious programmes of P.T.V. till such time that controversies started in the country in connection with certain view of the talker.

Answering another question, the Minister said Pakistan Broadcasting Corporation or Pakistan Television Corporation did not impose any ban on the writings of anyone. However, he said, those poets, writers, artists, etc, whose works, performance or views were known to be against the ideology of Pakistan or who did not observe professional discipline or did not come up to the required standard, were not invited to participate in radio and TV programmes.

He informed the questioner that Pakistan Broadcasting Corporation had disallowed only one artist, Mirza Sultan Beg (alias Nizam Din), to take part in radio programmes. He said this was because of the production of a cassette in his voice which contained obscene and objectionable material. P.T.V. had not imposed any ban on any individual, writer, poet or artists.

New Radio Stations

Raja Zafarul Haq also informed the Majlis that Pakistan Broadcasting Corporation had a total of 16 broadcasting stations in the country. He said there were plans for setting up new radio stations and also for increasing the power of existing ones.

During the next five-year Plan period, he said, there was a plan to set up new radio stations at Rahimyarkhan, Chitral and Zhob. Similarly, the Minister said, 10 K.W. transmitters were proposed for Gilgit and Turbat, and a 300 kw transmitter at Khuzdar, replacing the present low-power transmitter.

The Minister also informed the House that a new broadcasting house was proposed for Karachi, while 10 kw (2nd channel) transmitters at Karachi and Peshawar were proposed to be replaced by 100 K.W. transmitters.

Replying to another question, he said a new broadcasting house at Khairpur was already under construction and expected to be completed by the end of the current financial year.

The Minister did not agree with a questioner that the Indian TV programmes were promoting Indian culture in Lahore and border areas of Pakistan. He said the situation was now quite the reverse, because of the impact of the Pakistan TV programmes.

CSO: 5500/4305

PAKISTAN

BRIEFS

NEW SIND TELEPHONE LINES--The province of Sind minus Karachi will have 4,850 additional telephone lines. This was stated by the General Manager of Southern Telecommunication Region, Mr Wali Mohammad. He said there were at present 38,000 telephones working in the STR with the highest number of 9,000 in Hyderabad and the lowest in the internationally known ancient city of Moenjodaro which had only five connections. In Hyderabad, the installed capacity was 13,000, but the working connections were limited to 9,000, he said. Mr Wali said there was surplus capacity in Jamshoro, Kotri and Hyderabad SITE. There was more demand for telephones and less connections were available in areas of Hyderabad Central Exchange and Latifabad. He said the STR began from Bin Qasim on the National Highway and at Zero point (Toll plaza on the Super Highway) covering the whole of the province comprising 12 districts. There were 222 telephone exchanges, out of which 31 were auto-exchange. The General Manager said that during the current year additional connections would be provided in the Central Exchange area of Hyderabad Cantonment, and the city exchange would be expanded by 2,000 and Latifabad by 1,000 lines. The additional connections of 4,850 to be provided in the current year, would include 3,700 in big cities and 1,150 in rural areas. [Text] [Karachi DAWN in English 9 Oct 82 p 10]

NEW EXCHANGES FOR FAISALABAD--FAISALABAD, Oct 6--Three new telephone exchanges with 3000 lines each have been planned for Faisalabad which would start functioning within next 2 years. Disclosing this, Mian Aftab Ahmad Assistant Chief Engineer, Pakistan Telephone and Telegraph Department said the department had already completed the survey for the construction of these new telephone exchanges in Ghulamabad Colony, Samanabad Colony and outside Montgomery Bazar. He said with the commissioning of these exchanges, Faisalabad will be able to have 15,000 new connections within next two or three years. At present about 10,000 telephones are operating in the city, out of which 7,000 are installed in main city exchange, 1500 in People's Colony exchange and 1500 in Sargodha Road exchange. [Karachi DAWN in English 7 Oct 82 p 6]

CSO: 5500/4305

FUJIAN EXPANDS INTERNATIONAL COMMUNICATIONS

Fuzhou FUJIAN RIBAO in Chinese 14 Aug 82 p 1

[Article: "Adapt to the Implementation of Special Foreign Policies and Versatile Measures, Our Province Expands International Communications with Foreign Nations and Hong Kong and Macao, Postal Relations Have Been Established With Most Nations and Regions of the World, Ordinary International Telegrams Now Reach Over 130 Nations and Regions"]

[Text] After the third plenum of the party, especially since our province implemented the special policies and versatile measures, postal and telecommunications between our province and Hong Kong and Macao and foreign nations have developed more visibly.

At present, except South Africa, South Korea and Israel, our province has established postal relations with all other nations and regions of the world, and direct mail has been established with over 10 nations including Singapore and the Philippines and Hong Kong. This has speeded up the mail service. In 1980, Fuzhou Prefecture also began international express mail and special delivery reaching more than 10 nations and regions including Japan, the United States, Canada, France, Switzerland, Britain, the Netherlands, Hong Kong. This service mainly involves the financial, commercial, foreign trade and scientific and technical sectors which send commercial papers, commercial samples, engineering blueprints and spare parts that have a time urgency. All processes from receiving to sending follow a strict predetermined plan. Special messengers and vehicles are dispatched for special delivery. Safety and time are guaranteed. Special delivery of express mail is the fastest postal service in the world today. For example, express mail from Fuzhou to Hong Kong takes only 2 days and it takes only about 3 days to the United States. This service is welcomed and it has served an active function in promoting the development of scientific, technical and cultural exchange and trade between our province and abroad.

In telecommunications, our province has already established communications with over 40 nations and regions including Japan, Singapore, the Philippines, the United States, Australia and Hong Kong. Telecommunications messages have increased year after year. They have increased 55.6 percent between

1980 and 1981. During the first half of this year, they have increased another 34.4 percent over the same period last year. In February of this year, direct telephone lines between Fuzhou and Hong Kong went into service. The quality of service has gradually improved. The telephone waiting time has been greatly shortened. For example, 97.8 percent of telephone calls between Fuzhou and Hong Kong have been connected within 15 minutes, and 97.8 percent of the telephone calls between various localities in the province and Hong Kong have been connected within 25 minutes. Telegraph services have also improved a lot. Ordinary international telegrams reach more than 130 nations and regions. To adapt to the need for open communications abroad and to provide convenience to the user in the province, 14 foreign trade companies, the Huafu Company, the Provincial Electronics Bureau and some import-export firms have already begun user telegraph services reaching more than 60 nations and regions. The user can communicate on their own premises directly with certain foreign companies to conduct commercial telegraphic communications. The Fuzhou Telegraph and Postal Building and the Post and Telecommunications Bureau on Xinhua Road in Xiamen have also established public user telegraphic services. Foreign and overseas Chinese businessmen and domestic and foreign tourists visiting Fujian can use their own language or codes to transmit messages without going through the internal procedures of key punching, sending, receiving, and transmitting messages. Also, as long as the user telegraph is operating, it can receive incoming messages, unlike long distance calls which requires the presence of the receiver. Because the user telegraph has such a characteristic, it is welcomed. Since the Fuzhou Post and Telecommunications Building began public user telegraphic exchanges have amounted to 13,156 as of Juen of this year. When a foreign businessman sends a telegraphic message the other party can begin to answer questions in the first part of the message before transmission of the whole text is completed. In February of this year, an overseas Chinese businessman sent a message and received an answer within several minutes. He said happily, now it is more convenient to do business in Fujian.

9296
CSO: 5500/4026

ENTEL INAUGURATES DIALING EXCHANGE SYSTEM

Buenos Aires CLARIN in Spanish 8 Sep 82 p 25

[Text] The National Telecommunications Enterprise (ENTEL) will put the so-called Buenos Aires digital Belt into operation tomorrow at a cost of $120 million. Its purpose is to decongest communication between this city and Greater Buenos Aires.

During the press conference held yesterday at ENTEL Engineer Manuel Lavandeyra, head of the technical team which worked on the project, reported that it "is the most important digital system in the world up to now" and that, among other advances, it uses optical fiber conductors instead of the traditional copper cables.

The construction of six exchanges, the installation of computers, the placing of the cables and making the project operational took 30 months.

The project will be financed by means of ENTEL's own money and, as Engineer Lavandeyra said, "by no means will surcharges be added to the rates" to pay for the works which were carried out by a consortium consisting of the firms Nippon Electric, Pecom Nec, Sumitomo Corporation and Sade and Sade Obrelmec.

The project involved the replacement of three exchanges (which serviced calls to and from the Federal Capital and Greater Buenos Aires), by six new ones which will take care of that traffic by means of a digital system. They will also handle calls between various points in Greater Buenos Aires.

It was reported that the transmission system by meansof light impulses through optical fibers will be gradually introduced in the Federal Capital but even though this technology can be used for exchanges located far apart such as Rosario and Cordoba, Mar del Plata, Mendoza and Tucuman, "up to now nothing has been said about extending the Digital Belt" to the interior of the country

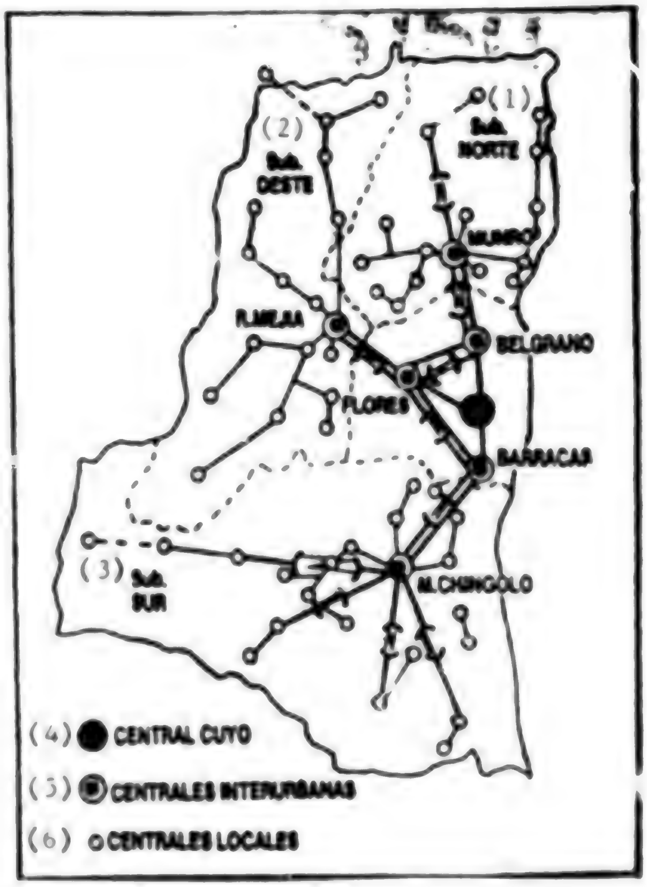
The technicians explained that this system is completely reliable and is not sensitive to climatic conditions. With the system of cables now in use it is not unusual for large numbers of telephone lines to be out of commission when rains of normal intensity occur.

Another innovation is that with the equipment installed in the new centers, it will be possible to make instantaneous connections between the lines of more than 100 exchanges with about 1.5 million subscribers.

In addition, alternate systems are contemplated which can be connected when the main lines are saturated.

The new centers are installed in Flores, Belgrano, Barracas, Monte Chingolo, Ramos Mejia and Munro. They are connected by optical fiber to the Buenos Aires National Commutation Center.

It was reported that, "the degree of technical development of the equipment used will allow the progressive extension of the digital ring to all the terminal exchanges of Buenos Aires through a gradual switch to analog-digital converters.



(1) North suburb	(4) Cuyo exchange
(2) West suburb	(5) Interurban exchanges
(3) South suburb	(6) Local exchanges

The map shows the main branches of the new digital system and the metropolitan areas which will benefit from the new service.

9204
CSO: 5500/2001

BRIEFS

TELCO EXPANSION--Construction work is in progress on the extension of Grenada Telephone Company. The addition will house new equipment from the German Democratic Republic to improve existing services. The new equipment will be supplied under a line of credit of $3.8 (U.S.) million, given by the Government of the German Democratic Republic. Estimated cost of the construction is $750,000 (E.C) Other plans for the upgrading of the telephone services include construction of exchanges in St. George's South, St. David's and Carriacou. The Telephone Company became the property of the Government and people of Grenada in January, this year when the shares of Continental Telephone International Finance Corporation (CTIFC) were brought over for $1. As part of the agreement with CTIFC, the Government has to pay the company's debts of approximately two and a half million dollars. [Text] [Port-of-Spain TRINIDAD GUARDIAN in English 29 Sep 82 p 5]

CSO: 5500/7506

FUTURE PLANS FOR BROADCAST COMMUNICATIONS DISCUSSED

Kingston THE SUNDAY GLEANER in English 12 Sep 82 pp 11, 27

[Article by Vincent Tulloch]

[Text] MICHAEL HENRY, Minister of State in the Ministry of Tourism and Information does not like to talk about information in a loose way, when discussing his responsibilities as a Minister of State in Prime Minister Edward Seaga's Government. Instead, he says he feels more at home with the word "communication".

And that can be readily understood, as the Central Clarendon politician has been involved in a branch of communication for quite some time. He is the owner of Kingston Publishers Limited, one of the nation's leading publishers.

In a mid-August interview, a few days before he left for a United States International Communication Agency (USICA) sponsored media tour of the United States, he talked about the Government's plan for information/communication in the country.

Against the background of the 1980 election manifesto of the Jamaica Labour Party, I tried to see what sections were being fulfilled. Alas! the manifesto has apparently been put on the shelf to gather dust.

In one area, where the manifesto mentioned the many problems in broadcasting, action has been taken. On the age-old problem of equipment, Mr. Henry had this to say "that area had been in such a bad shape, worse shape than one would have thought. The magnitude of the investment that is required to update the equipment has had to be looked at against the background of the economy. The decision to change to colour had to come, because the equipment in black and white is outdated.

Overhauling project

Having identified problems facing the television service, Mr Henry went on to talk about plans for the overhauling of the state-owned media. On that score he said "We are now looking at a total package including the change over to colour and equiping the news room of the JBC." This overhauling project he said applies to the other section of the media.

I then asked the Minister for a figure for the project. He replied "The proposals for the JBC is for $15 million. This is an immediate need, but because of economic conditions, we are trying to implement this over the next two years. The JIS needs will run into the region of about $3.4 million and that is just to bring it up to a serviceable level."

The change over to colour has been taking much longer than expected, so I asked Mr. Henry the reasons for the delay. The reason he said was funding. He went on "the installation of transmitters to service the various receivers and the corresponding funding are holding up the change over, but everything should be in place for December/January.

On the JIS, Mr. Henry said that when the government took office, the organization was in a state of crisis. He said that officers were used for party campaigns and that there were only five information officers and few useable vehicles. According to the Minister, all that has been rectified. The information officers are now in place, 16 out of a required 17. There are vehicles and regional offices are again functioning.

Second voice

The Jamaica Daily News which the government put up for sale is now being organised and published by the government to offer what Mr. Henry said is a second voice in the country.

He explained the obvious contradiction in government policy in this way: "the government had put the Daily News up for divestment, infact the News is still up for divestment, but we had no serious offer, or what we consider serious. There was an offer from the staff which virtually would have left the paper in their hands without any transfer of ownership.

Continuing, he said "the government feels that there should be more than one newspaper, and rather than closing it down, the government decided that it would run it, try to rebuild it and make it a more worthwhile property to an investor."

I asked the Minister if it were any business of the government to run a newspaper or offer the country a second voice.

He replied: "It is not necessarily the business of the government to provide that voice, but it is its business to keep open as many avenues of expression to the public. There is no reason why a responsible government cannot run a newspaper.

Mr Henry said that the plans fo the government for the News are geared to make it a viable newspaper within two years so that it can be offered for sale. He dismissed my question which suggested that the government was interfering in the editorial direction of the NEWS. He attributed the changed editorial policy of the paper to economic realities and not government intervention. He would not quote a figure for equipping the News but did indicate that it would be a large sum.

Second channel

On the expansion of the state owned media, Mr. Henry said that the objective of the Government was geared to providing more top class programmes. In that context he explained plans for the implementation of the second channel on JBC.

Concerning the second channel he said: "Plans for channel two are well advanced and that ties in with the funding situation that exists at JBC." Continuing he said "it won't be difficult to put a second channel on the air, if you are going to rely on canned programmes. So we are looking at the links in the creation of a production centre which will open avenues for original and creative materials that relate to our cultural tapestry of the society.

The production centre referred to is that proposed for Montego Bay which is to be constructed with the help of foreign capital. In a January issue of RADIO-TV AGE, it was reported that the centre would be involved in all types of production for the big and small screen.

I asked the Minister to justify the continued hold on the electronic media by the government. He replied: "The government has publicly stated that the Jamaica Broadcasting Corporation has been given a three-year moratorium to establish itself and make itself economically viable. This grace period, he said, will end in the next 18 months.

Licences

I asked: "If JBC has three years to provide good service, why are licences being withheld from others who could use the time to get equipment and train staff and begin transmission in 1981?

Henry responded thus: "this is not quite as simple in terms of some of the background things that have to be dealt with. The Broadcasting Authority Law is being looked at now, and this relates to the Media Commission. That report is before the Cabinet. Then there is the Copyright Law which must be updated and several other things. And in any case, when one talks about private enterprise licences for broadcasting, it must be remembered that it takes nothing to set up a television station than money.

Is that what we want? Someone to spent $10 million on equipment. Who is going to direct that creativity of the indigenous and cultural material that is necessary for the development of the nation? Who is going to create the programme?

Q. "If the Government owns two or so channels, why worry about other channels as long as they operate within the confines of the law?

HENRY: "I find that a very strange question. We have a complex society. A very complex one. We have our social strains. Would we allow a television station pulling off a satellite to advertise such things as American products against the economic situation that exists? Wouldn't you be creating imbalances and social strains in the society? So you must have a balance in place."

Radio

On radio he said three foreign applications were received but no licences have been granted. Again the protection of local radio was cited for the refusal. Emphasis was placed on the regional stations, Radio West and Radio Central all subsidiaries of JBC to fill the gap for more stations.

Talking about an external matter, the introduction of Radio Marti to Cuba by the American Government and the likely effects on Jamaican radio signals, Mr. Henry had this to say: "The government is aware of the problems that may arise." However he said that there is no contingency plan to deal with jamming if Jamaica should become a victim to a propaganda war between the U.S. and Cuba.

Radio Marti will begin transmissions to Cuba in January on a budget of U.S.$17 million. Located in Florida it will transmit signals on the 1010 (AM) wave band off 500,000 watts. President Fidel Castro has vowed to counter the American station which he said will be subversive. Cuba plans to set up a matching station to jam American commercial stations.

On Monday, August 31, Cuba served notice on the U.S. by putting the VOICE OF CUBA on the air blocking out seven stations including WHO (Des Moines, Iowa) the station Reagan once worked as an announcer.

Several technical people believe that in a radio war on the AM band, countries such as Jamaica with relatively weak radio signals could be blocked out especially at nights. Local radio broadcast on [illegible] watt on most transmitters with two or three on 10,000. This on the AM band gives an average clear reception area of 2[illegible] miles.

But on other interferences on local broadcast signals, Mr. Henry said: "Right now we are affected heavily by other Latin American countries. There are some Venezuelan and Colombian stations that have been giving us problems. We are discussing this with the appropriate bodies."

Cable Television

The Government's monopoly of information extends well beyond radio/television. Already the Jamaica Telephone Company (state owned) and the Jamaica Broadcasting Corporation will enter the cable world later this year. There are likely to be 15-17 channels on cable television and again JBC will get at least three channels. First programmes will go out to hotels and later home subscribers. Again there are no plans for immediate private participation.

In fact a private firm TERRACOM Ltd., which had a contract to beam cable television programmes to the Pegasus Hotel and had set up a dish at the site was refused permission and its dish bought by the JBC.

According to the Minister all aspects of communication are being looked at as a package. Satellite transmission and the use of telext (cable newspaper/business, professional information) will be tightly controlled by the state.

Much of the Government's plan seems to be in line with the Soviet/Third World sponsored New International Information Order.

Yet Henry claims not to be too well versed on this aspect of information.

On the overall access to the state media by politicians and minority groups, the Minister of State Mr. Henry said most reporting in Jamaica has been traditionally balanced around government officials no matter who or what is in power. On claims of censorship by groups such as the Workers Party of Jamaica and its several fronts he said: "the government has no policy or does it give any direction to the media on censorship. In any event, I have not received any letter of complaint since assuming this position from any group on that score."

CSO: 5500/7505

BRIEFS

RADIO STATION AGREEMENT--An agreement to establish two transmitting stations worth DH260 million in the al-Dab'iyyah area was signed today between the UAE Information and Culture Ministry and the Swiss company BBC Brown Boveri. The first station, a mediumwave, will be equipped with two 1,000 kilowatt transmitters directed to the Gulf, the Middle East, India and Pakistan. The second, a shortwave station will be equipped with four 500 kilowatt transmitters broadcasting worldwide. The project is expected to be completed in 28 months. [GF201308 Manama WAKH in Arabic 1700 GMT 19 Oct 82 GF]

CSO: 5500/4503

BRIEFS

AFRICAN NEWS AGENCIES MEETING--Dakar, 19 Oct (NAN)--A coordinating committee meeting of the integrated program for the development of national news agencies in Africa will be held on 30 October at the Pan-African News Agency (PANA) headquarters in Dakar, Senegal. The meeting is expected to harmonize multilateral assistance to develop news agencies on the continent and to review the assistance to PANA in several areas. These include human resources, equipment, and training. Participants at the meeting will include the UNESCO deputy director for communication, Gerard Bolla; the president of the African Council for Communication, Madam Elizabeth Okwendje; and representatives of the International Telecommunications Union and other organizations. [Text] [AB191310 Lagos NAN in English 1237 GMT 19 Oct 82]

CSO: 5500/14

GHANA

BRIEFS

$9.9M TV, TELECOM PROJECT--Two Japanese experts are in Ghana to finalize arrangements for the construction of new telecommunication and television lines to be financed by their government. They are Mr Yozu Mukoyama, deputy manager, First Division Loan Department and Mr Nobuo Sugita, deputy manager, First Technical Apraisal Division, both of the Overseas Economic Cooperation Fund, Japan. In an interview with the Ghana News Agency in Accra, Mr Mukoyama said they would meet officials of the Ministry of Finance and Economic Planning, Posts and Telecommunications Department and the Ghana Broadcasting Corporation for the final signing of the 5.9 million (about ¢6 million) project. Ghana and Japan signed exchange notes on the loan for the project last July 28. Under the agreement, Ghana will repay the loan which carries three-and-a-half percent interest rate in 30 years with 10 years moratorium. Mr Mukoyama said his government would continue to identify economic problems facing Ghana and assist where possible. Giving details of the project, Mr Sugita said work would officially begin next year and be completed by the middle of 1986. Under the project, the microwave link from Accra to Bolgatanga which cannot cope with the present demand of telephones and telegrams will be replaced. A new microwave for television would also be constructed in Kumasi to serve Bolgatanga to enable television viewers to come abreast with television viewers in Accra on the same day, instead of T.V. films being flown to the Northern and Upper Regions the following day. [Text] [Accra GHANAIAN TIMES in English 18 Sep 82 p 3]

CSO: 5500/17

FREQUENCY-HOPPING MILITARY RADIO DISPLAYED

MB170838 Johannesburg SUNDAY TIMES in English 17 Oct 82 p 5

[Article by Ken Slade]

[Excerpts] South Africa's domestic arms industry has achieved another major breakthrough by developing a unique, frequency-hopping radio system which cannot be monitored by an enemy.

This was disclosed yesterday by the head of Armscor, commandant Piet Marais, soon after his return from the controversial weapons exhibition in Greece.

The existence of the radio--something which major countries in both west and east have been trying for years to produce--has not previously been disclosed.

But the system, which effectively prevents an enemy from intercepting messages between military patrols and bases, was exhibited by Armscor in Athens.

Commandant Marais said yesterday:

"I can now state publicly that South Africa has produced such a radio system, and that it has been in use under operational conditions for the past two years."

The Armscor head said the system, which hops automatically from one frequency to another every split second--thus making it impossible for an enemy to tune into broadcast--had excited much interest when it was unveiled at the Greek exhibition.

"It was such a sensation that a large international electronics firm flew in experts to view it," he said.

Cmdt Marais said: "It is correct that no sales took place at the show, but we did not expect that.

"After all, arms deals are long processes. It is not like buying sheep from an agricultural show.

"I can say, however, that we achieved our objectives."

"I believe the Greek Government is now just attempting to save face by saying that they threw us out.

"In fact, we had already asked the organisers if we could pack up our goods to get early customs clearance," he said.

CSO: 5500/13

BRIEFS

DEFENCE FORCE COMPUTERS--KIMBERLEY--When a Kimberley man who recently received documentation from the Defence Force in Afrikaans, requested English documentation, he was told there was none available. A spokesman for the Defence Force in Pretoria said yesterday it was impossible for English documentation to be made available because the documentation was a computer feed-out, and the unit concerned did not have the money for an English print--as well as for Afrikaans. When asked why several sheets of documentation could not be printed in English, the spokesman, who was from the Minister of Defence's Office, refused to comment. Asked what the man concerned was supposed to do if he could not understand Afrikaans, the spokesman answered: "He is a south African citizen, isn't he?" [Text] [Johannesburg THE CITIZEN in English 12 Oct 82 p 9]

LIBRARY COMPUTER NETWORK--A COMPUTERISED bibliographic and information network--known as SABINET--will be instituted in South Africa next year, the Minister of National Education Dr Gerrit Viljoen announced in a statement last night. Libraries and information services will now gain access by means of the SABINET-system to nearly 3 000 000 titles of books and pamphlets of importance for research. This will be done by means of computer terminals and video screens. Any library with a terminal or video screen connected to SABINET will be able to trace information about a particular publication, as well as its author and other details. The decision to develop the service comes after research by the former National Library Advisory Council the statement said. [Text] [Johannesburg RAND DAILY MAIL in English 18 Sep 82 p 3]

BLACK TV AWARDS--A BLACK TV awards ceremony similar to the Artes Awards ceremony will be held from next year. This was announced by the SABC yesterday. The ceremony has not yet been named nor has a trophy or format been decided on. The only detail which has so far been finalised is that awards will be made to both TV2 and TV3 in the same categories. A producer from TV2, for example, would win an award side by side with a producer from TV3 in the same category. The various categories will be more or less on the same lines as those of the TV1 Artes Awards ceremony, but will not cover as broad a field. As in the case of the Artes Awards, radio will also be considered. Radio Sotho, which includes Northern Sotho, Southern Sotho, Tswana and Venda, will compete against the Nguni languages which are Radios Zulu, Xhosa, Swazi and Tsonga. The panel of judges will consist of SABC as well as outside experts. [Text] [Johannesburg THE CITIZEN in English 6 Oct 82 p 9]

CSO: 5500/5

ZIMBABWE

RADIO FOUR BROADCASTS TO BEGIN 4 OCTOBER

Harare THE HERALD in English 28 Sep 82 p 1

[Text] **RADIO FOUR will start broadcasting at 9 am next Monday, providing eight hours of wide-ranging educational programmes every day during its initial phase.**

The station will broadcast on FM and short-wave frequencies until all of the 11 transmitters imported for the station have been installed.

Thereafter, all areas of the country will be able to receive the station on FM frequencies.

The station will remain on the air until 8.30 pm, but will link up with Radio One for lunch-time news bulletins and the major evening news bulletin, as well as with Radio One and Radio Two at varying times each day.

The major contributor to Radio Four's programmes will be the Ministry of Education's audio-visual services, based in Mount Pleasant, which will provide an average of three hours of programmes each day, ZBC's director of programmes, Mr Grey Tichatonga, said in an interview yesterday.

Programmes would also emanate from other ministries and some would be sponsored by private companies which wished to have educational material relating to their products broadcast.

In addition he said, the Zimbabwe Broadcasting Corporation would produce non-formal educational programmes.

The major responsibility of the station, as outlined in a draft policy document still to be approved by the board of directors, would be the promotion of adult literacy, Mr Tichatonga said.

The station would also support the Zintec teacher training programme, he said.

Next on the list of priorities would be agricultural training. Then would come labour and social services and the promotion of good relations between management and employees.

The fifth area of importance, according to the draft policy, would be the emancipation of women, "as championed by the Ministry of Community Development and Women's Affairs — not women's lib", he said.

The Ministry of Youth, Sport and Recreation would have the next claim to broadcasting time, followed by various other ministries.

This could include giving the Ministry of Home Affairs broadcasting time to help it eradicate dissidents or the Ministry of Trade time for the promotion of an understanding of the reasons behind the shortage of foreign currency.

Marxist philosophy, including programmes on dialectical materialism, historical materialism and Marxist economics, would be "part of Radio Four's normal schedule", Mr Tichatonga said.

This would be to help the public understand the basis of the country's socialism, he said.

Mr Tichatonga said that although the station would only be broadcasting eight hours of programmes initially its production capacity would be expanded after the British Council had assisted in the extension of the Radio Four studio complex and the ZBC Mbare complex was complete.

The station would broadcast from Pockets Hill, but programmes were also being produced at Mbare and Montrose, in Bulawayo.

Well-known radio personalities who will be heard on Radio Four include Mavis Moyo, John Masuku, Forbes Kahari, Peter Parirehwa and Simon Makasa.

ZBC will begin to advertise the frequencies on which Radio Four can be heard from Wednesday, this week. The three hours of programmes produced by the audio-visual service will be aimed mainly at schools, Mr Tichatonga said.

CSO: 5500/6

MERGER OF COMPUTER FIRMS REPORTED

Harare THE FINANCIAL GAZETTE in English 24 Sep 82 p 8

[Text] **ASSOCIATED Business machines and Maintenance (Pvt) Ltd (ABM), the local dealers and agents for IBM equipment, have become a subsidiary of Systems and Management Services (Pvt) Ltd (SMS).**

"With ABM supplying the equipment, and SMS the systems and programming expertise, in addition to extensive experience in the computer market in Zimbabwe, this union will prove to be an advantageous one," said Mr John Dawson, managing director of both companies.

As the new managing director Mr Dawson represents the only change on the ABM board. A geologist with a degree from the University of Zimbabwe, Mr Dawson moved into the computer world in 1969 by joining IBM.

Since then has had extensive experience in this field in South Africa, Mocambique and Zimbabwe. For the last eight years he has been a council member of the Computer Society of Zimbabwe and was its president from 1979-81.

35 STAFF

When SMS started in 1973 there were only two staff members — Mr Dawson and his secretary. Today the staff numbers 35.

ABM is a much younger company which came into being in 1981, after aquiring the local assets of IBM World Trade Corporation which had been operating in this country since the early 1960's.

"The range of equipment offered by ABM is restricted both in the office product dealership division and the data processing equipment side where the company acts as an agent for IBM products. This policy ensures that we do not stretch our foreign currency allocation beyond a realistic point. We have selected a particular section of the market and aim to provide that sector with an excellent product backed by a first class service," said Mr Dawson.

In the office product range the company only imports the correcting golf ball typewriter but also maintains a wide range of IBM equipment which has been imported by customers themselves.

POWERFUL

Similarly with the data processing equipment ABM have restricted themselves to the IBM System/34. This is a very powerful mini computer and the models announced for the Zimbabwe market have a range of memory positions from 64 000 up to 256 000 and a disk capacity of 64 megabytes to 256 megabytes. The largest of these machines can attach up to 16 local work stations and as many as 64 remote work stations on a countrywide basis through a communications network supplied by the PTC. The first of these machines has recently been installed at Shell and BP's head office in Harare.

ABM also offers a wide range of software products designed to improve the utility of these machines.

"As a result of the merger ABM will be placed in a strong position to make a positive thrust in the local market place, fully armed with the necessary marketing, systems and engineering tools to make that thrust felt," said Mr Dawson.

CSO: 5500/6

COMPUTERS WILL SOLVE TEACHERS' PAY PROBLEMS

Harare THE HERALD in English 14 Oct 82 p 3

[Text]

THE Ministry of Education and Culture is getting seven computers to help solve problems of teachers' salary payments, the minister, Dr Dzingai Mutumbuka, told the seminar yesterday.

A new system was being introduced because he wanted to ensure that teachers got their salaries on time. It would start at the beginning of next month.

His ministry had received many complaints of bad treatment and deliberate withholding of teachers' salaries by district councils. "District council officials must learn to separate their extramural activities from their responsibilities," he said.

Cde Mutumbuka said some of the district councils had not measured up to the Government's expectations. There appeared to be a lot of inefficiency, inertia, laziness and inability to do work properly.

The Government could not continue to run the districts by posting communiques from Harare, and for decentralisation to be truly meaningful, district councils were expected to play an important, serious and responsible role in rural areas.

Allowances for building Government rural secondary schools had been increased this year and the Swedish International Development Authority had provided funds for building one house for teachers at each of the private rural secondary schools.

The Minister of Local Government and Town Planning, Cde Enos Chikowore, said that the Government should recognise only two types of councils —urban and rural.

While it was accepted that the contradiction between rural and urban councils could not be removed for a long period to come, he believed that the present rural and district councils could be unified.

The Minister of Lands, Resettlement and Rural Development, Cde Moven Mahachi, said about 100 tractors, which were on their way from a friendly European country would form part of the ministry's tillage unit.

The unit would have centres throughout the country and would assist people in rural areas — who had lost their cattle through the war or through tsetse flies — to plough their lands.

There were also plans to establish small dairy schemes in rural areas. Tied to this was the establishment of the Agricultural Rural Development Authority, whose specific task was to produce, wheat, soya beans and other strategic agricultural commodities.

ARDA already had bases at Sanyati, Chisumbanje and in Matabeleland.

Ziana reports that Cde Oliver Munyaradzi, the Minister of Health, said that effective preventive health services could cut the country's disease rate by as much as 50 percent.

CSO: 5500/19

ZIMBABWE

BRIEFS

IMPRESSIVE COMPUTER INDUSTRY--Two Tanzanian government computer experts have expressed admiration at the degree of sophistication of Zimbabwe's computer industry. The officials--Mr Alfred Newa, director of computer services for the Tanzanian government and Mr Patrick Michael, senior systems analyst--were in Harare to discuss with International Computers Ltd Tanzania's plans to replace its present equipment with a more up-to-date system. They paid particular attention to ICL's ME29 computer which they felt could prove the main component of their refurbishing plans. The Tanzanians visited the ICL plant and several business houses in which ME29 computers are already installed. [Text] [Harare THE HERALD in English 13 Oct 82 p 7]

FOURTH RADIO SERVICE--HARARE--The State-owned Zimbabwe Broadcasting Corporation yesterday launched the country's fourth radio service--a station that beams educational, cultural and news broadcasts in several languages. Radio Four is headed by British Broadcasting Corporation-trained, Mr Stanley Nyahwa. [Text] [Johannesburg THE CITIZEN in English 5 Oct 82 p 16]

ZBC REPORT CLARIFIED--A REPORT by Ziana on Tuesday quoted the Director of Programmes at the Zimbabwe Broadcasting Corporation, Cde Grey Tiehatonga, as saying Radio Four's broadcasting capacity would be expanded after the British Council had assisted in the extension of the Radio Four studio complex and ZBC's Mbare complex was complete. Cde Tichatonga has pointed out he referred to British Council assistance in the extension of the Ministry of Education's Audio-Visual complex at Mount Pleasant, not to an extension of the Radio Four complex. The council is not involved in the completion of the ZBC's Mbare complex. [Text] [Harare THE HERALD in English 30 Sep 82 p 3]

CSO: 5500/5

FEDERAL REPUBLIC OF GERMANY

BRIEFS

BIGFON CONTRACT FOR SIEMENS--The Deutsche Bundespost has awarded Siemens the contract to implement the BIGFON telecommunications project in Munich and Berlin. It will be worth about DM 23.5 m. BIGFON (broadband integrated glass-fiber local communication network) will use glass fibers to give subscribers access to modern communication services such as videotelephony, telex, teletex, videotex, facsimile and a number of radio and television programs in addition to the normal telephone service. Siemens will install a complete BIGFON local network in both Munich and Berlin consisting in each case of fiber-optic cables, transmission, switching and distribution equipment as well as subscriber terminals. The projects will be realized by the end of 1983. [Excerpt] [Munich DATA REPORT in English Jun 82 p 29]

SIEMENS DELIVERS BUNDESPOST EXCHANGES--The first EWSD digital exchanges for the public telephone network of the Deutsche Bundespost were handed over by Siemens on 30 April 1982. The long-distance exchange in Hamburg is equipped with 3,800 trunks, the exchange in Stade with 800. In the autumn of 1982, the Deutsche Bundespost will receive one local EWSD exchange for Mannheim and one for Moerlenbach. The firms DeTeWe and TN also tender for EWSD to the Deutsche Bundespost. Both firms are involved in the development of EWSD. Local and transit EWSD exchanges are already in operation in Finland and South Africa. Orders have been received from Egypt, Argentina, Finland, Greece, Libya, Austria, the Philippines, South Africa and Switzerland. EWSD represents another milestone for Siemens in public switching systems. State-of-the-art semiconductor technology has been combined with data processing experience and switching system knowhow. New features have been introduced for customers and administrations and the space requirement reduced to about a fifth of that needed for earlier systems. Great emphasis was placed on ease of operation of EWSD. The 64 kbit/s channels used in EWSD provide the prerequisite for the integration of all communication services such as speech, text, picture and data transmission in a common network ISDN (Integrated Services Digital Network). Public exchanges of all types and sizes can be realized with EWSD: local exchanges, national and international long-distance exchanges. [Text] [Munich DATA REPORT in English Jun 82 p 29]

CSO: 5500/2514

THOMSON-CSF AIM FOR 15 PERCENT OF WORLD TELECOPIER MARKET

Paris ELECTRONIQUE ACTUALITES in French 24 Sep 82 p 12

[Article by D. Levy]

[Text] Laval -- It is a rare, not to say unique event in the annals of the French electronics industry for a company to introduce a new product onto the market while holding orders for that product that will keep it busy for close to 2 years. What makes it even more startling is that more than 80 percent of those orders are for export, and that three quarters of them come from North America!

And yet that is precisely the coup Thomson-CSF has pulled off with its Thomfax 2000 and 3000 telecopiers, built at its Laval plant where the green light for the marketing operation has just flashed on.

That backlog involves 20,000 Thomfax 2000s and 10,000 Thomfax 3000s, for distribution in the United States by 3-M; tacked onto those is a contract for 5,000 telecopiers for EGT, the French telephone company (PTT) subsidiary. Combined, these orders allow Thomson-CSF to count on 500 million francs' worth of business in 1983, and to fulfill its ambition of becoming top cat in the telecopy industry with a 15-percent share of the world market.

The telecopier market is growing at around 25 percent annually in the United States, 30 percent in Japan, and 35 percent in Europe. In 1982, however, almost every telecopier we have seen was made in Japan -- with the exception of the ones produced in France by Thomson-CSF and CIT-Alcatel. By all indications, the American manufacturers took a look at the ante and pulled out of the home and self-service copier market to invest in plant for the next generation of heavy-duty telecopiers. Meanwhile, we see Xerox distributing copiers built by its Japanese associate, Fuji, to supply the American market (50 percent of the world market), while Qwip is pushing machines from Sharp and Burroughs is selling others from Murata. As for 3M, which commands 20 percent of the U.S. market and has a huge distribution system with 250 vendors, has decided to market the Thomfax 2000s and 3000s.

This means that the Japanese now command a genuine strike force in telecopiers, with four world-ranked firms (Matsushita, NEC, Toshiba, and Richoh) and eight or nine manufacturers (including Hitachi, Oki, Murata, Canon, Mitsubishi, and Sanyo...), to cover not only their own market (25 percent of the world's total), but almost all the rest of the foreign market as well.

In Europe (with 15 to 20 percent of the world market), the only builders besides Thomson-CSF and CIT-Alcatel who still look like staying the course are Muinhead and Siemens. Even there, though, the Japanese are stepping up the pressure , particularly in Scandinavia and in Great Britain.

30 Percent of the French Market

This Japanese challenge is what Thomson-CSF intends to pick up, as it aims at 15 percent of the world telecopy market that would allow it to stay up among the blue-chip companies in the field. Thanks to very penetrating market analysis, sound technological decisions, and a firm agreement with 3M, the first hand in the tournament seems to be in the bag: Thomson-CSF is certainly going to be able to stay the course until 1984. The company's future from then on will depend on the new generation of product coming on the market when that time comes.

Thomson-CSF got into telecopiers in 1977, following consultation with the Industrial and International Affairs Directorate (DAII) as to developing a home telecopier (TGP) that would be very cheap (at the time there was talk of 1,000 francs apiece with production of 100,000 units per year). Thomson-CSF moved into phase 2 of its operation (with Matra and Sagem) when, in April of 1979, it was awarded a contract for a pre-production run of 50 telecopiers. Then, in a startling move in December 1979, the PPT switched policies and announced it would not make any massive copier purchases. The General Telecommunications Directorate (DGT) thereupon washed its hands of the entire affair, and urged industry to take its chances on the world market. That left most of the companies involved with no choice but to pull out (which is what Matra and Sagem did) or to come up with a new global strategy behind a new product.

That was the road Thomson-CSF decided to take, switching from the home or office copier to the big distribution copier (TGD). In December 1980, Thomson-CSF got a firm order from 3M for 20,000 telecopiers, then known as the Thomfax 2000, backed up in June 1981 with an order for 10,000 Thomfax 3000s (with an option on another 5,000 machines) to be marketed under the "Tegefax" tradename.

The first Thomfax 2000s were delivered to 3M by year's end, at which time Thomson-CSF announced it had delivered some 3,500 telecopiers. Gradually production at the Laval plant reached 1,000 telecopiers per month, including both the 2000 and 3000 models, and in the following year production reached 3,000 per month. In France, where Thomson-CSF hopes to control 30 percent of the market very shortly, the company's telecopiers will be marketed by three distribution systems: EGT's, Thomson's (privately owned telephonics) and that of 3M-France. Abroad, marketing will be handled by 3M and Thomson's own marketing teams (such as Eurosignal in Federal Germany), while Thomson-CSF will make other deals with domestic partners.

No Big Machines

In its approach to telecopiers, Thomson-CSF took a careful look at current market trends: split between the individual desktop teleprinter which is viewed as merely an adjunct to the telephone, and the self-service telecopier that can be used by anybody to send important mail. The firm voluntarily ruled out big machines, because it feels that the market for them is too limited and because there are other communications media that are probably less costly.

The study of expressed requirements in line with the current trend moved Thomson-CSF to design a range of five telecopiers, ranging from the little Thomfax 1000, manually operated, which can talk to all Group 2 and Group 1 copiers, to the Thomfax 6000, the big machine in Group 3, which can process 9,600 bites per second (which is the equivalent of sending an entire A4 document in 20 seconds), and which was designed primarily for electronic mail. Between these two extremes will come the Thomfax 1600, a Group-2 copier, which is cheap, compact, and offers automatic reception, produced by OKI in Japan, with which Thomson-SCF will test the market before launching a device of its own design, along with its Thomfax 2000s and 3000s.

These latter two, entirely designed by Thomson-CSF, will account for some 90 percent of the builder's telecopier sales. The Thomfax 2000 is a "universal" teleprinter, compatible with Group 2 and Group 3 machines, with automatic reception, good resolution, and a transmission rate of 2 minutes for an A-4 document; it is competitively priced at around 23,000 francs. The Thomfax 3000, which is a descendant of the 2000, is a "true Group 3" machine that can send an A4 document in 1 minute, and offers high resolution: it is priced at 39,000 francs.

We hear that Thomson-CSF plans to introduce a digital Thomfax 4000 within 2 years, which will replace the 6000s now made in America by 3M.

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CSO: 5500/2507

JEUMONT-SCHNEIDER'S PLANS IN OFFICE AUTOMATION OUTLINED

Paris ELECTRONIQUE ACTUALITES in French 17 Sep 82 pp 1, 13

[Article by D. Levy: "Jeumont-Schneider is Forming an Office Automation Branch"]

[Text] At a press conference held on 14 September, Mr Devin, chief executive of Jeumont-Schneider, announced the entry of his group into the office automation field.

At Jeumont-Schneider, this new activity is conceived as an extension of its private telephone interests. The company's industrial goal is therefore to produce an automatic office center that integrates text processing and data processing functions, and makes use of microcomputer and specialized terminals. In other words, a move identical to that of the Canadian company Mitel, and one which IBM also appears interested in adopting. To achieve its office automation plan--which was approved by the Ministry of Research and Industry--Jeumont-Schneider has reached agreements with Microfive, a small American company specializing in microcomputers, and with SG 2 in France. In order to become the manufacturer and assembler of office automation systems that it wishes to be, Jeumont-Schneider will invest 100 million francs over a three-year period, with the prospect of obtaining a turnover of 1 billion francs in four years.

For Jeumont-Schneider, office automation is a branch formed by the juxtaposition of digital switches, intelligent terminals, and microcomputers, all of them connected through a compatible network. And the company believes that it has in hand the most important element of office automation, the automatic switch. It is true that Jeumont-Schneider has demonstrated a remarkable dynamism and innovative spirit in this field, having reached the first rank of French manufacturers in private telephone systems within a few short years. This innovative spirit remains true this year, when Jeumont-Schneider will show at SICOB a time-division switch with advanced terminals (the Jistel 30 X), an entirely digital automatic switch with channel by channel coding, which accepts all types of office terminals (the TLC 8), and a telephone set equipped with a small display screen which shows the number of the calling station, while also signalling and memorizing eight calls when the subscriber is not present (the Jistel T2).

In addition to its experience with telephone automatic switching equipment which will be developped toward office switching, Jeumont-Schneider expects to depend on the competence of two subsidiaries: SECRE in the area of terminals, and CERCI in that of industrial software.

Agreements with Microfive

In its strategy for independence, Jeumont-Schneider looked for a micro-data processing partner in order to round out its know-how. It found it in the California company Microfive, with which it will develop office microcomputers. The agreements reached by the two partners cover a manufacturing and sales license for Microfive's present and future microcomputer lines, in exchange for a significant Jeumont-Schneider participation in Microfive's capital, in order to orient the latter's technical development and exercise a certain control on the composition of two office automation research and development companies, one in France and the other in the United States. The first of these companies will be 100 percent controlled by Jeumont-Schneider and will hold shares in the second, formed with Microfive.

The selection of Microfive was determined by the communication possibilities of its microcomputers (use of real time software which lends itself well to X-25 integration, electronic mail, voice messages, text processing, and so on), which were not offered by any French micro-data processing company. Moreover, this small company (40 people), created in 1977, has developed a line of intelligent professional terminals based on technical solutions compatible with those of Jeumont-Schneider. Its most recent computer, the Jispac 1000, a communications processor, will be exhibited at SICOB.

The agreement with Microfive will give Jeumont-Schneider a technical mastery of multistation, multipurpose micro-data processing systems, which are well adapted to the office automation market. The manufacturing will be carried out by the SECRE plant in Soissons (after initial purchase of several hundred machines from Microfive).

The research company formed by the two partners, with wich CERCI will collaborate, will develop the integration software for the PABX-Bureautique products. The integration of micro-data processing systems into Jeumont-Schneider's automatic switches will lead to their transformation into office automation devices through the addition of text and data processing functions. The research company located in France will also coordinate the office automation activities of Jeumont-Schneider, SECRE, and CERCI. In fact, a director in charge of office automation, Mr Lhermann, has just been named at Jeumont-Schneider. He will create a team of 2000-2500 employees drawn from the various divisions of the group and from subsidiaries, in order to fulfill the office automation project in collaboration with Microfive.

Alliance With SG 2

The agreement with Microfive is complemented by an understanding with SG 2 (fourth computer information and assistance company in France, with a turnover of 1 billion francs). The two groups have already worked together, with Spectral, an SG 2 subsidiary, distributing jointly with SECRE the Secretex 2200 text processing systems. The new agreements go even further, in that the two groups have decided to join their efforts for the marketing of office automation and data processing systems, notably by creating the joint company Jistral.

The latter will combine the Spectral and SECRE office automation sales forces. Its capital will be split 51 percent for Jeumont-Schneider and 49 percent for SG 2. It will initially distribute 70 specialists in France among 18 agencies. Spectral, in which Jeumont-Schneider will have a minority share, will limit its activity to the installation and maintenance of data processing systems; it will have 110 employees.

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CSO: 5500/2361

DEVELOPMENT OF NEW DIGITAL WAVEFORM GENERATOR

Milan ALTA FREQUENZA in English Jul-Aug 82 pp 226-228

[Article by Daniele Caviglia, Alessandro De Gloria, Giuliano Donzellini, Domenico Ponta Universita di Genova, Istituto di Elettrotecnica, Sezione Ingegneria Biofisica ed Elettronica Viale F. Causa, 13 - 16145 Genova]

[Text]

Abstract. This paper describes the design and implementation of a waveform generator built at the Section of Biophisical and Electronic Engineering (S.I.B.E) of the Electrical Engineering Department of the University of Genoa, Italy.

The instrument allows the digital synthesis of a completely arbitrary waveform, programmed by its mathematical expression or defined sample by sample, through the D/A conversion of its stored digital values, with a minimum time interval between samples of 25 nanoseconds.

I. INTRODUCTION

Complex waveforms generation is nowadays of continously growing importance for better testing and characterization of both electronic and electromedical devices under the widest possible range of working condition.

Such a requirement, arising from the increasing complexity of the problems to be solved, cannot be met by ordinary waveform generators that lack the necessary flexibility and controllability.

Digital techniques and microprocessor based systems allow the design of instruments that meet the above requirements.

To satisfy as many as possible of our research needs at SIBE and, at the same time, to implement a general purpose test instrument with advanced specifications, exceeding the ones of commercial products, we developed the digital waveform generator presented in this paper.

The goals were to obtain very good electrical characteristics, such as excellent accuracy and repeatibility of samples amplitude, the widest possible frequency range from dc up to video band, frequency stability together with a full programmability of the output waveform. Furthermore the user can choose the waveform in completely interactive manner, can change parameters such as frequency and amplitude and has available synchronizing signals to interface with complex digital-analog systems.

The performances obtained meet very well the above mentioned design goals and compares very favourably with the ones of commercially available sets operating according to the same principle [1-2].

The waveform generator is currently used at SIBE for the study of the interaction of electromagnetic fields with biological structures and the test and calibration of the in-house developed image analisys system ACTA 500.

II. STRUCTURE OF THE CIRCUITS

Bandwidth limited waveforms can be generated through D/A conversion of digitally coded values fed to the input of a D/A converter according to a programmed sequence.

A feasible technique is to compute the digital samples from the mathematical expression of the desired waveform and to store these samples into adjacent locations of memory.

The waveform is then generated by a cyclic scan of the memory locations where the samples have been previously written. The frequency of the generated signal can be controlled in a wide interval through the timing of the scanning clock.

The instrument's general architecture is shown in Fig. 1. Five basic units can be identified:

- Clock generator : this circuit outputs the driving clock for the RAM addressing counter, controlling the frequency of the generated waveform and determining its stability. The circuit is a classical implementation of PLL (Phase Locked Loop) techniques and [illegible]e of generating a TTL level signal in the frequency range 0.5Hz - 50MHz with a four figure resolution.

The circuit is divided in two parts: the first is a phase locked loop system, which can synthesize any frequency in the range between 5 and 50 MHz with 10 KHz step. Programming of this frequency is obtained on the feedback counters according to the following expression, where N is the division ratio:

$$Fsyn = Fref \times 10N$$

In our case Fref = 1KHz and N = 500-5000.

Lower clock frequencies can be generated by using the second block of the circuit that divides Fout by powers of 10. So the output frequency is given by the expression:

$$Fout = Fref \times 10N/10^{m}$$

where $m = 0 - 7$.

The circuit has been realized on a double-Eurocard format board with TTL components.

- 12-bit programmable counter: it is in charge of addressing the Memory . Beside the counter, there are a 12-bit comparator to output an end-of-count signal and a control logic, which outputs the load and clock signals to the counter, an auxiliary clock signal CKA and the first sample sync pulse. Another 12-bit comparator is also employed to obtain a pulse synchronized with any intermediate sample. The interface with the memory is buffered. The circuit has a maximum working frequency of 40 MHz.

It outputs the address to the memory and can be programmed by varying either the starting or the ending word of the counter. It can also be used as a latch and in this way it allows a very easy addressing of the memory during the write operation. It has also the capability of performing a single scan of the memory just by stopping the count on the starting word immediately after the first occurrence of the ending word. The user can also choose between two clock inputs and two single-shot controls.

- High speed memory and D/A converter: the 4K x 12-bit memory has been designed accordingly to a classic scheme with four groups of 12 integrated circuits of 1K x 1 bit capacity and with the proper timing features.

Memory speed is of primary importance in determining the upper limit of the useful waveform bandwidth. The time interval between samples, indeed, cannot be shorter than the memory access time and, on the other hand, the highest useful frequency component in the output waveform is limited by the sampling rate.

The design chosen employs HMOS static RAM chips characterized by an Address Access Time lower than 20 ns.

Special care was taken to transmit the data to the microcomputer: this was performed through the D/A latch block to minimize capacitive load effects.

Since the very large bandwidth operational amplifier connected to the D/A converter to obtain a voltage output operates only in the inverting mode, the one-complement of the memory contents were used. In this way a direct proportionality has been reached between the stored samples and the output voltage level.

The latch "freezes" the samples on the positive going edge of the properly delayed clock signal (CKA).

-Microcomputer: to maximize the capabilities of the waveform generator , a microprocessor based section has been developed.

The main features of the microcomputer are high mathematical flexibility, easily expandable structure, RS 232-C and IEEE 488 interface, twenty Data In and twenty Data Out lines.

The microcomputer has been realized using an Intel 8085 CPU supported by a numeric processor (APU), the AMD 9511, able to perform higly complex mathematical computations.

The microcomputer is implemented on three boards (double Eurocard format) with Intel standard components.

III. SOFTWARE MODULES

The microcomputer is controlled by a small stand alone operating system specifically designed for this machine. The system occupies 8 kbytes of EPROM and requires a minimum of 1 kbyte of RAM.

The user has a full control of the instrument functions throgh a terminal (TTY, CRT) connected to the serial interface. The waveform generator can therefore be remotely operated without any interaction with the front panel.

According to the previous description, the waveform is characterized by the following elements:

- number and value of samples stored in memory
- boundary of the memory space occupied by the samples
- scan frequency

Once the waveform is determined a set of facilities improves its usefulness. For example:

- sync output in corrispondence of an arbitrarily chosen single sample
- single shot
- external clock capability
- capability to stop the waveform generation

This mode of operation has been implemented by a set of Intel 8085 Assembler programs. The user can instruct the instrument accessing the various program segments through the appropriate commands. Every function is performed by a dedicated routine.

Every time a user wants to generate a waveform, he must specify to the instrument the starting memory address for the waveform. Next step is the definition of the samples values and two different procedures are available to execute this operation. The first one requests from the user the FORTRAN- like expression of the waveform, from which the instrument computes

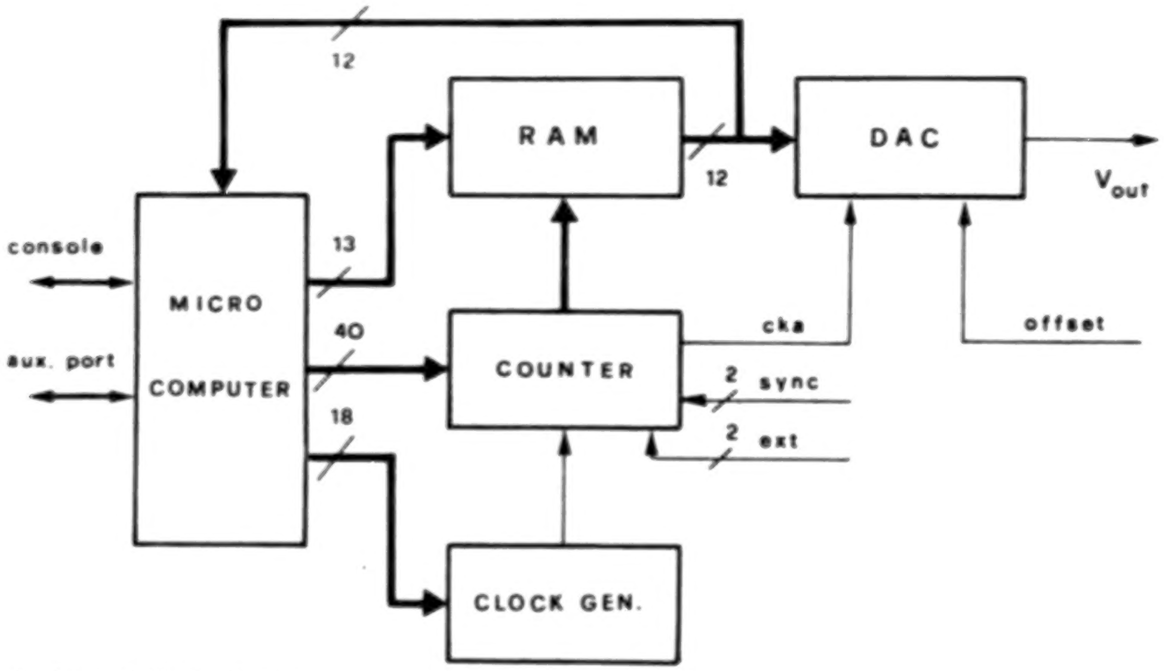

Fig. 1. General block diagram.

the samples values according to user specifications (number of samples, time interval between them) supplied in an interactive way. Samples computation is made in two steps: in the first the mathematical expression is interpreted and transformed in Reverse Polish Notation, in the second the samples values are computed by the arithmetic processor unit (AMD 9511).

In the second procedure of waveform definition the user can utilize a classical Edit program to directly store data in RAM sample by sample. In this case signals whose mathematical expression is too complex or undefined can be reproduced.

When the samples have been generated in either one of the two possible ways and the address of the last sample, in addition to the scan frequency, is supplied to the instrument, a command starts the waveform generation.

The flexibility of the programming procedure allows the storage in RAM of any combination of waveforms and the generation of just pieces of them simply by changing starting and ending addresses.

IV.INSTRUMENT FEATURES AND FIELDS OF APPLICATION

The main features of the instrument can be summarized as follows:

- Capability to generate any waveform defined inside a 4096 x 4096 sample grid.
- Time between two consecutive samples variable from 25 ns to 2 s.
- Output voltage +/- 4.5 V and offset up to +/- 5 V.
- Sync pulse output in corrispondence with any waveform sample.
- Internal and external single shot with sync output.
- Capability of defining more than one waveform up to 4096 memory words.
- The cycle repetition frequency and the number of samples can be interactively changed by the user.
- The instrument can be connected to a mass storage device, such as a cassette or floppy disk, where to store the most commonly used waveforms to transfer to the RAM when needed.
- EIA RS-232 C and IEEE 488 interface.

Finally we summarize a few possible applications of the arbitrary waveform generator:

- General purpose instrument for testing and measurements of analog and digital circuits.
- Characterization and testing of video and image analys systems [3].
- Analysis of transducers and servomechanisms.
- Transient simulation for electromechanical machines.
- Transient analysis on electronic devices.
- Generation of exposure waveforms to be used for studying the interaction between electromagnetic fields and biological structures [4].
- Simulation of complex biological signals (ECG, EEG etc.).

REFERENCES

[1] Wavetek, "Test and Measurement Instr. 81-82, Model 175", San Diego (CA), 1981.

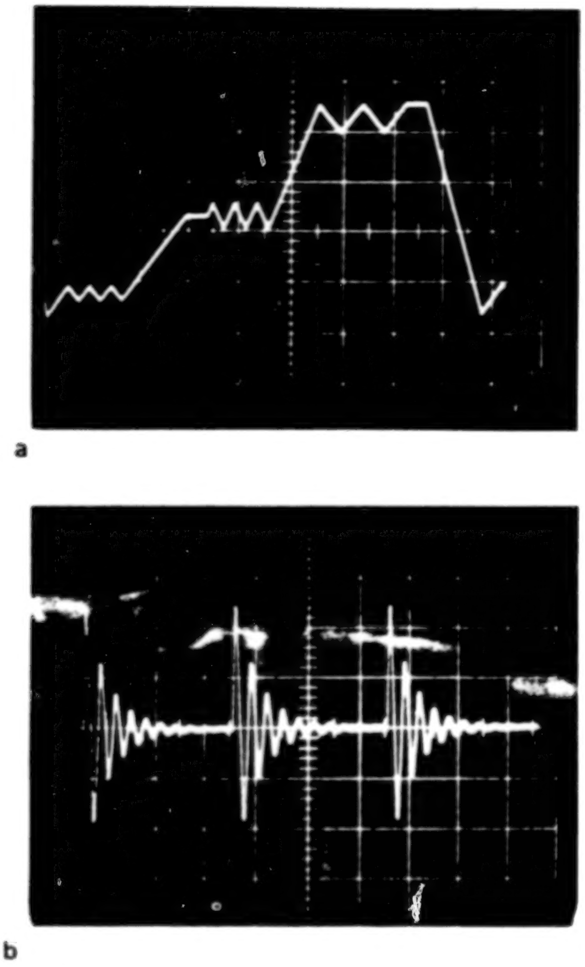

Fig. 2. Examples of waveforms:
a)piecewise linear function: sampling frequency 21.5 MHz.; samples per cycle: 1000; scope scanning: 5 S/div
b)Exponentially amplitude modulated sine wave: sampling frequency: 15 MHz.; samples per cycle: 1000; scope scanning: 5 S/div.

[2] Le Croy, "Model 8606 Tech. Data", Spring Valley (NY), 1981.

[3] F.Beltrame, A.Chiabrera, M.Grattarola, P.Guerrini, G.C.Parodi, D.Ponta, G.Vernazza, R.Viviani, "ACTA: Automated image analisys system for absorption, fluorescence and phase contrast studies of celll images", 2nd Annual Conf. of the IEEE Engineering in Medicine and Biology Society, Washington, Sept. 1980.

[4] F.Beltrame, A.Chiabrera, M.Grattarola, P.Guerrini, G.C. Parodi, D.Ponta, G.Vernazza, R.Viviani, "Electromagnetic control of cell functions", Alta Frequenza, vol. XLIX No. 2, pp. 101-114, March-April 1980.

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